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Transtheoretical Model: Applications in the Prevention and Treatment of Cancer

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TRANSTHEORETICAL MODEL

One theory of behavioral change, the transtheoretical model, has shown great promise in guiding interventions aimed at health behavior change across a variety of behaviors, populations, and settings. This theory, which is often referred to as the *stages of change* model, has been developed and studied for more than 15 years. It was based originally on reviews and comparisons of psychotherapy and behavior-change approaches [1,2]. Early research focused on identifying the mechanisms of change in self-changers as well as in individuals involved in formal behavior-change interventions. Several consistent mechanisms of change were identified in a series of studies on behavior change in the areas of psychotherapy and addictive behaviors [1–3]. In particular, it was found that individuals pass through a series of stages when changing a behavior. In addition, effectively changing a behavior involves matching the principles and processes of change that are most appropriate for the identified stage.

To date, the Transtheoretical model has been applied widely in the prevention, management, and rehabilitation of disease with a variety of behaviors, diseases, and special populations. Interventions based on the model have been implemented in numerous settings, including high schools, community health clinics, work sites, managed-care organizations, family-planning clinics, physician's offices, and at the beach (e.g., increasing sunscreen use). The goal of the current paper is to provide an overview of the Transtheoretical model and give examples of its potential application in the prevention and treatment of cancer, especially in youth.

Core Constructs of the Model

The core constructs of this model that have been identified through years of research in behavioral change include the stages of change, decisional balance, situational self-efficacy, and the processes of change. These constructs have been validated with many behaviors across a variety of populations [4–7].

STAGES OF CHANGE

Five stages of change have been identified. These stages include precontemplation, contemplation, preparation, action, and maintenance.

In the *precontemplation stage,* the individual reports no intention of changing the target behavior. The person may not be aware of the need to change or may be in denial about the negative impact of the behavior. A person in the *contemplation stage* is one who is thinking about changing the behavior in the foreseeable future. The foreseeable future is usually defined as the next 6 months, because this is about as far into the future as people tend to make plans. Although individuals in this stage are thinking about changing their behavior, they are often very ambivalent about the change and may remain in this stage for an extended period. We often refer to such individuals as ''chronic contemplators,'' because they are constantly thinking about making a change but do not take action. A person in the *preparation stage* is one who is planning to make a change in the near future, which is generally defined as the next 30 days. In addition, people in the preparation stage have begun to take small steps toward changing their behavior. These individuals are ready to change their behavior completely and need to develop a good plan of action to make the change successfully. People in the *action stage* are those who have recently made the desired behavior change. However, they are at risk of relapsing or recycling to their previous pattern of behavior. Therefore, they still need to manage carefully their temptations to return to the previous behavior. Last, individuals in the *maintenance stage* are those who successfully changed a target behavior at least 6 months earlier. These people are confident that they can continue to maintain their new behavior and experience few temptations to return to the previous behavior. Individuals in the maintenance stage are still at some risk of relapse.

Research with the addictive behaviors suggests that there may be another stage, called *termination,* in which maintenance of the behavior appears to be on ''automatic pilot'' [8]. That is, the person no longer needs to work at maintaining the behavior. At this stage, the person feels fully confident about the behavior and no longer experiences temptations to return to earlier patterns of the be-

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havior. Reaching the termination stage may take many years. Although individuals may reach a termination stage for cessation of addictive behaviors, it is unclear whether acquisition behaviors, such as exercise, will have a termination stage.

Progress through the stages is not necessarily a linear process, but generally involves a pattern of recycling to earlier stages before long term maintenance is achieved. Knowledge of the person's current stage of change is important in identifying the best matched intervention approach to help move the person forward to the next stage. *Specific intervention approaches are most beneficial if they are matched to the appropriate stage.* Furthermore, interventions that are mismatched to the person's stage of change can lead to failure of the intervention. This failure may be associated with demoralization in both the individual and the professional. Therefore, interventions that are matched carefully to the person's stage of readiness for change have the best chance of success. The application of this model to change a particular behavior involves first identifying a person's stage of change and then matching the appropriate principles and processes of change for that stage.

DECISIONAL BALANCE

One important construct included in the model involves the balance between the pros and cons of changing the behavior. This construct is called *decisional balance.* Evaluation of the pros and cons of changing a behavior is critical in the early stages of change, especially precontemplation and contemplation. Before a person can move forward toward action, the perceived importance of the pros or benefits of changing a behavior must outweigh the cons or costs of change. In fact, a consistent pattern of pros and cons across the stages has been found across a number of behaviors [9]. That is, the cons of change are higher than the pros in the precontemplation stage, a crossover occurs somewhere in the contemplation or preparation stages, and the pros of change are higher than the cons in the action and maintenance stages. One important principle of change regarding decisional balance is that the individual must increase the pros or benefits of changing a behavior to progress forward from precontemplation or contemplation to become ready to make a change [10]. Therefore, intervention approaches with individuals in these stages should focus on increasing the perceived benefits of the new behavior.

SITUATIONAL SELF-EFFICACY AND TEMPTATIONS

Situational self-efficacy and temptations represent related constructs that reflect individuals' confidence in their ability to change or maintain a desired behavior or their anticipated temptations to return to the previous, undesirable behavior. The perceived self-efficacy and anticipated temptations need to be assessed across a variety of risky situations to identify the situations in which the person will feel most confident and those in which they will feel most tempted. Self-efficacy is usually lowest in the earlier stages. Temptations are usually highest in the early stages and decrease across the stages. Two important principles of change that are related to self-efficacy include the following: 1) Individuals must feel confident about their ability to make the desired change, and 2) they must learn new ways to manage situational temptations to move forward through the stages. Therefore, interventions that are focused on individuals in the earlier stages of change should help individuals build their self-confidence in making the desired behavior change and identify risky situations and ways to manage the temptations to return to the undesirable behavior when facing such situations. The processes of change provide important tools to help accomplish these goals.

TABLE I. Sample Profile of an Adolescent in Precontemplation Stage for Medication Use

Precontemplation: No intention of taking medication as prescribed
May be in denial about disease
May be attempting to establish personal autonomy or control
Focuses on the costs or disadvantages of taking medication as prescribed
Sees few of the benefits of taking the medication
May not feel confident in own ability to follow the regimen as prescribed

PROCESSES OF CHANGE

Ten key processes of change have been found consistently across research studies. These processes provide the key tools for changing behavior. The processes are categorized into two main groups: experiential and behavioral. The experiential processes are focused on cognitive and affective approaches to help a person move forward through the stages toward making the desired behavior change. The behavioral processes provide the specific behavioral tools needed to make the change.

Experiential Processes

Consciousness raising (gather information) involves being open to new information about the importance and benefits of changing the behavior as well as the specifics of how to make the change. *Dramatic relief* (express emotions) involves expressing emotions about the behavior and/or its potential negative impact. *Self-reevaluation* (change self image) involves making positive changes in one's self-image related to the target behavior. *Environmental reevaluation* (reflect on impact of behavior) involves the consideration of the impact of one's behavior

TABLE II. Sample Behavior-Change Tools for Adolescents in the Early Stages for Medication Use

Increase the pros or benefits of following the regimen
Build confidence in own ability to follow the regimen
Use of following processes of change
Consciousness raising, e.g., provide information on the importance of the regimen as well as the specifics of how to follow the regimen
Self reevaluation, e.g., encourage the development of a positive self-image that focuses on thinking of one's self as a mature autonomous person who cares about his or her own health and wants to take good care of himself or herself
Dramatic relief, e.g., encourage person to think about stories of how others did not take care of themselves and experienced a negative outcome; then also encourage them to think of how the story could have ended differently if the person had taken better care of himself or herself
Environmental reevaluation, e.g., encourage the person to think of the impact his or her behavior has on important people in his or her life

on the external environment, including other people. *Social liberation* (reflect on social norms) involves realizing that social norms are changing to support healthy behavior change.

Behavioral Processes

Self-liberation (make a commitment) involves making a commitment and using one's will power to change the target behavior. *Stimulus control* (take control) involves structuring the environment to best promote the new behavior, such as by removing cues for the undesirable behavior and increasing cues for the desirable behavior. *Helping relationships* (get support) involve enlisting the support of others to help promote the behavior change. *Reinforcement management* (reward change) involves getting rewards or rewarding oneself for positive change in the target behavior. *Counterconditioning* (substitute new thoughts and behaviors) involves replacing negative thoughts that would interfere with the performance of the new behavior or substituting new, desirable behaviors in place of the undesirable one.

Matching Interventions to Stage

The key aspect of matching patient treatment by using this model is to identify the person's stage of change and then apply the principles and processes of change that are appropriate for that particular stage and individual. Expert system computer-based interventions have been developed to provide stage-based, individualized feedback for large populations of individuals. This expert system stores the key decision rules and normative data to create the individualized feedback for different individuals [11]. To provide individualized feedback, a person must first complete questions that assess each of the areas of the model. Then, feedback based on these responses may be provided either in the form of a written report or through an interactive computer program. The feedback provides information on the specific processes and principles of change that are most important for advancing a particular individual to the next stage of change. *This individual feedback may be combined with other stage-based intervention approaches, such as counseling and/or written self-help materials.*

TABLE III. Sample Profile of an Adolescent in the Preparation Stage for Medication Use (Adolescent example)

Ready to follow the medication regimen as prescribed
Feels more confident in own ability to follow the regimen
Needs the behavioral tools to change behavior to follow regimen

Several large-scale, randomized smoking-cessation intervention studies have demonstrated the effectiveness of appropriately matching the stage with the intervention approach based on the transtheoretical model [11,12]. This research has shown that stage-based, individualized interventions are superior to traditional, action-based approaches. *Furthermore, in these studies, expert system-guided approaches have been the most successful stage-based interventions for smoking cessation.*

APPLICATION OF THE TRANSTHEORETICAL MODEL IN THE PREVENTION AND TREATMENT OF CANCER

Smoking Cessation: Example of Cancer Prevention

This model has been widely applied across behaviors important in the prevention of cancer, such as reducing dietary fat, reducing sun exposure, and smoking cessation. It has also been used with increasing cancer screening approaches, such as getting regular mammograms. For the purposes of illustration, an example will be provided on its use with smoking cessation. Individuals in the first stage, precontemplation, report that they have no intention to change their smoking in the foreseeable future. Such individuals may be in denial about their behavior and may see few benefits of changing. The person is likely to be focused on the benefits of smoking, such as helping to manage stress, and the disadvantages of quitting, such as withdrawal effects or weight gain. Precontemplators tend to ignore information or advice about the health risks of their behavior. Those in the contemplation stage are intending to quit in the foreseeable future. These individuals are interested in quitting but may not feel confident that they can quit. Those in the preparation stage have reported an intention to quit in the near future and also have demonstrated behavioral progress toward

TABLE IV. Key Behavior-Change Tools for Preparation Stage

Keep focused on the pros or benefits of following the regimen
Use the following processes of change
Self liberation, e.g., make a public commitment to follow regimen
Stimulus control, e.g., place reminders around home, workplace, or school to facilitate adherence with regimen
Helping relationships, e.g., enlist the support of friends and family to facilitate adherence with regimen
Reinforcement management, e.g., develop an incentive plan to get rewards or reward self for following regimen
Counterconditioning, e.g., assist in developing a plan for replacing negative thoughts that would interfere with following regimen

quitting by taking small steps toward the final goal. For example, people in the preparation stage may have reduced the number of cigarettes they smoke or changed their brand to one with a lower nicotine level. These individuals are highly motivated and are confident that they can quit successfully. Individuals in the action stage have recently quit but are at high risk of relapse. Those in the maintenance stage have quit for 6 months or more and have remained smoke free throughout that period of time.

When working with individuals in the early stages, the focus should be on increasing the perceived benefits of quitting and applying the experiential processes of change. For example, it is important to help the person to learn more about the importance of quitting (consciousness raising), begin to see themselves as a health-conscious person versus a smoker (self reevaluation), consider the impact of their smoking on others around them (environmental reevaluation), and recognize that societal norms are changing to promote a smoke-free environment, such as through smoke-free restaurants (social liberation). In addition, encouraging smokers in the early stages to think about and express emotions about someone they know who died from a smoking-related illness (dramatic relief) may be helpful. When using this process, it is also important to help the person recognize that quitting will help them avoid such negative consequences.

Applications in the Treatment of Cancer

Although no published research has been focused on the application of this model in the treatment of cancer, there are a number of ways in which it may be helpful for practitioners working with children with cancer and their families. In particular, the model may have direct application in working with adolescents and may also be useful in working with the parents of younger children with cancer.

Direct application with youth. In addition to modifying behaviors, such as smoking and diet, which are important in cancer prevention, this model can be applied with the behaviors and lifestyle changes needed in the treatment of cancer. The current discussion will focus on the use of medication in adolescents as an example.

When prescribing a particular treatment regimen to an adolescent, it can be helpful to assess their stage of readiness so that the prescribed regimen is followed closely. Although, hopefully, it would be rare, it is possible that an adolescent might be in an early stage of readiness, such as precontemplation (see Table I). Individuals in this stage are not intending to follow the regimen. This may be especially likely with adolescents who are in denial about their disease or are struggling with control or autonomy issues. These teens are likely focusing on the costs or disadvantages of taking the medication as prescribed, see few of the benefits of taking the medication, and may not feel confident in their own ability to follow the regimen as prescribed. Knowledge of the person's level of readiness will be especially helpful in matching the appropriate intervention approach.

Adults, including health providers, often make requests of adolescents and children with the assumption that they should comply simply because the request is from an adult. Providing the individual with a rationale for the request and the benefits of the recommended behavior may enhance the person's readiness to follow the regimen as prescribed. Like with other behaviors, teens in the early stages may benefit the most from understanding the importance of the treatment approach and the specifics of how to follow the regimen (consciousness raising) as well as the benefits of complying with a treatment approach (decisional balance; for a list of the key behavior-change approaches for the early stages of change, see Table II). It would also be helpful to build the person's self-confidence in changing the current behavior, such as by reviewing examples of how they were able to change other important health behaviors, especially closely related behaviors. Other experiential processes of change may also be helpful with adolescents in the early stages. For example, working with adolescents to develop a positive self-image that focuses on thinking of themselves as mature, autonomous people who care about their own health and want to take good care of themselves (self-reevaluation) may help them to become more ready to follow the regimen. In addition, helping the person consider the impact of the behavior on other important people in his or her life (environmental reevaluation) may also help to move the person closer to action. For example, encouraging a young woman to consider how her mother or best friend would feel if she did not take her medication as prescribed and ended up in the hospital: They might be very worried about her well

being and health. In addition or instead, it may be helpful to encourage her to think about how happy and relieved they would feel to know that she was taking her medication so she could be as healthy as possible.

It may also be helpful to elicit the expression of emotions by encouraging adolescents to think about stories of how others did not take care of themselves and experienced negative outcomes (dramatic relief). When using this process, it is also important to follow up by encouraging individuals to think of how the situation could have ended differently if the individuals had taken better care of themselves. For example, a young man may know of another teen with cancer who did not follow the prescribed medication regimen, which resulted in an unexpected hospital admission and not being able to attend the state championships with his football team. It is important to encourage the teen to think about how he would feel in this situation and then review what he could do to avoid such unfortunate events. Although some clinicians may feel uncomfortable using dramatic relief, work on cancer prevention with adolescents has indicated that they may welcome this approach. It is noteworthy that the use of dramatic relief is most appropriate for early stages (i.e., precontemplation and contemplation).

Individuals in the preparation stage are ready to follow the medication regimen as prescribed, feel more confident in their own ability to follow the regimen, and are generally focused on the pros or benefits of following the regimen (see Table III). Once an adolescent is prepared to follow a particular treatment regimen, the focus is on using the behavioral processes of change to help provide them with the tools needed to change their behavior (see Table IV). For example, if the task is to help the person to be able to take a new medication on a regular schedule, then it may be helpful to post reminders on the bathroom mirror or school locker (stimulus control), set up a reward system for following the regimen (reinforcement management), and enlist support from family members to help in following the regimen (helping relationships). It may also be helpful for the person to make a public commitment (self liberation) to follow the regimen, such as by telling close friends. In addition, it would be important for the adolescent to plan ahead for countering any negative thoughts regarding the regimen (counterconditioning). For example, adolescents who are struggling with control issues may have the urge to skip a medication dose when they are angry with parents or are feeling nagged. It would be critical to discuss these possibilities with the person and have a specific plan for how to manage these temptations when they occur. In addition to providing the behavioral tools for change, it is important for the teen to be aware of any possible cons of following the regimen, such as side effects, and to be prepared with a long list of the benefits to keep focused on during these times.

Application in working with parents of children with cancer. When working with younger children, it is often the responsibility of the parents to change the child's behavior. Therefore, it is important to assess the parent's readiness for their behavior-change role. Given the child's condition, the parents will often tolerate or overlook a lot of problem behaviors. However, this is not healthy for the child, the parent, or other family members. When attempting to assist the parent in managing the child's behavior, it is best to match the intervention approach with the parent's readiness for working on the problem. It is possible that the parents are in the precontemplation or contemplation stages, in which they either are not intending to modify the child's behavior or are just beginning to think of doing so. A parent may be in an early stage of change for a number of possible reasons. For example, they may be in denial about the child's condition, they may feel that the child's behavior is acceptable given the child's cancer, or they may be overwhelmed with their own adjustment to child's condition and not have the energy to focus on modifying the child's behavior. In these early stages, the parents are likely to be focused on the costs or disadvantages of attempting to modify the child's behavior, they may see few of the benefits of attempting to modify the child's behavior, and they may not feel confident in their own ability to change the child's behavior. It would be helpful to identify the reason for the parent's lack of readiness for changing the child's behavior. For certain explanations, such as difficulty in their own adjustment to the child's cancer, it may be helpful to arrange for the parents to receive supportive counseling to assist them in their own coping.

When working with a parent in the precontemplation or contemplation stage, it is important to help the person see more of the benefits of changing the child's behavior and focus less on the cons or the costs of this change. Furthermore, it is important to help the parents feel confident that they have the ability to modify the child's behavior. One way to achieve this is to review the parent's previous successes at changing difficult behaviors in this child or in other children in the family. In addition, the experiential processes of change will be useful in working with parents in the early stages of readiness for change. For example, it would be helpful to provide information on the importance of modifying the child's problem behavior as well as the specifics of how to modify the behavior (consciousness raising). In addition, parents should be encouraged to develop a positive self image that focuses on being a parent who works to help their child live as normal a life as possible (self-reevaluation). It may also be helpful to encourage the parents to express their worries and feelings about their child's condition and their role in their child's behavior

(dramatic relief). In addition, the parent may benefit from considering the impact of the behavior on important people in his or her life, such as the child's siblings or classmates (environmental reevaluation).

Parents in the preparation stage are ready to work on modifying their child's behavior and feel confident in their own ability to change it. These parents generally need information and support in using the specific behavioral tools that will be helpful in changing the child's behavior. The parents may feel, as they begin to work on changing the child's behavior, that it is a difficult process. It is important for these parents to keep focused on the benefits of changing the child's behavior. In addition, the behavioral processes of change may be particularly helpful at this point. For example, it may be helpful for the parents to make a public commitment to modify the child's behavior by telling other family members, medical staff, and/or the child's teacher (self liberation). Furthermore, structuring the environment to encourage change in the behavior (stimulus control), enlisting the support of other family members (helping relationships), and using an incentive plan to reward the child for taking steps toward changing the problem behavior (reinforcement management) may help facilitate the desired change. It would also be important for the parents to reward themselves (reinforcement management) for their efforts in changing the child's behavior, because this often can be a difficult process for them as well. In addition, it would be helpful to develop a plan for replacing negative thoughts that can interfere with making efforts to change the child's behavior (counterconditioning).

SUMMARY

In summary, the transtheoretical model may help guide the choice of the best intervention approach to use when working to change behavior that is *important in the prevention and treatment of cancer*. In using this model, it is important to identify the person's stage of readiness for change as well as each of the other key constructs of the model, including *confidence and temptations, perception of pros and cons,* and *use of the processes of change.* Knowledge of these factors will guide the choice of the best *stage-matched interventions to help move the individual forward through the stages of change to achieve long-term maintenance of the desired behavior.*

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